National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 929a

Magnesium Gluconate

This Standard Reference Material (SRM) is certified for use as an assay standard for magnesium. It is intended primarily for use in the calibration and standardization of procedures employed in magnesium analysis and for the routine critical evaluation of daily working standards used in these procedures. The material is magnesium gluconate dihydrate: $Mg(C_6H_{11}O_7)_2 \bullet 2H_2O$ and is supplied in a unit of 5 g.

Certified Magnesium Mass Fraction: The magnesium concentration, expressed as a mass fraction percent on a dry-mass basis (see "Drying Instructions"), is based on measurements using isotope dilution – inductively coupled plasma – mass spectrometry (ID-ICP-MS) [1].

Certified Magnesium Mass Fraction: 5.362 % ± 0.027 %

The uncertainty in the certified value is calculated as $U = ku_c$, where u_c is the combined standard uncertainty calculated according to the ISO/JCGM and NIST Guides [2] and k is the coverage factor. The value of u_c is intended to represent, at the level of one standard deviation, the combined effect of uncertainty components associated with the measurement uncertainty and additional Type B uncertainties. The coverage factor is 2. The expanded uncertainty, $U = ku_c$, is defined as an interval estimated to have a level of confidence of 95 %. The measurand is the total mass fraction of magnesium. The certified value is metrological traceable to the SI units of mass, expressed as percent.

Expiration of Certification: The certification of this SRM is valid within the measurement uncertainties specified, until **01 September 2025**, provided the SRM is handled and stored in accordance with the instructions given in this certificate (see "Instructions for Storage and Use"). The certification is nullified if the SRM is damaged, contaminated, or modified.

Maintenance of Certification: NIST will monitor representative solutions from this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification.

Coordination of the technical measurements leading to the certification of SRM 929a was provided by K.E. Murphy and G.C. Turk of the NIST Chemical Sciences Division.

The certification analyses were performed by K.E. Murphy and T.A. Butler of the NIST Chemical Sciences Division.

The statistical evaluation of the data was performed by D.D. Leber of the NIST Statistical Engineering Division.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

Carlos Gonzalez, Chief
Chemical Sciences Division

Gaithersburg, MD 20899
Certificate Issue Date: 06 January 2016
Certificate Revision History on Last Page

Stephen J. Choquette, Acting Director
Office of Reference Materials

The magnesium gluconate dihydrate used for this SRM was obtained from the Spectrum Laboratory Products, Inc. (Gardena, CA)([1]).

NOTICE AND WARNINGS TO USERS

Stability of Prepared Solution: Solutions of SRM 929a prepared as instructed are stable for at least 60 days under normal laboratory conditions.

WARNING: This SRM is intended for research use.

INSTRUCTIONS FOR STORAGE AND USE

Storage: SRM 929a should be stored in the tightly closed, original bottle under normal laboratory conditions. Tests show this material to be hydroscopic and must be dried as directed before use; such drying will not remove water of hydration. Stored under these conditions, this material will show no significant change in properties.

Use: A standard solution containing 5.00 mmol/L of magnesium may be prepared by placing 1.133 g of dried SRM 929a in a 500-mL volumetric flask and dissolving the material with laboratory reagent grade water (see list below). Lower concentrations required for analysis may be prepared by accurate dilutions.

Laboratory reagent grade water meeting any of the following specifications:

American Society for Testing and Materials (ASTM): D1193-Type II
College of American Pathologists (CAP): Type II
National Committee for Clinical Laboratory Standards (NCCLS): Type I

Drying Instructions: This certified value is based on a minimum sample of 400 mg of the SRM dried to constant weight for at least 72 h over fresh anhydrous magnesium perchlorate. The certified value is based on the determination of magnesium in the *dried material.*

REFERENCES

[1] Long, S.E.; Murphy, K.E.; *Compilation of Higher-Order Methods for the Determination of Electrolytes in Clinical Materials*; NIST 260-162.

[2] JCGM 100:2008; *Evaluation of Measurement Data — Guide to the Expression of Uncertainty in Measurement* (GUM 1995 with Minor Corrections); Joint Committee for Guides in Metrology (JCGM) (2008); available at http://www.bipm.org/utils/common/documents/jcgm/JCGM_100_2008_E.pdf (accessed Jan 2016); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297, U.S. Government Printing Office: Washington, DC (1994); available at http://www.nist.gov/pml/pubs/index.cfm (accessed Jan 2016).

Certificate Revision History: 06 January 2016 (Editorial changes); 26 April 2005 (Original certificate date).

Users of this SRM should ensure that the Certificate of Analysis in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948 3730; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/srm.

[1] Certain commercial equipment, instruments or materials are identified in this certificate to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.